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Department of Public Health

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MONTANA STATE BOARD OF HEALTH

HELENA, MONTANA.

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"The science of disease prevention, if properly applied, can add fifteen years to the present average length of human life."—Prof. Irving Fisher, Yale.

This Bulletin will be mailed monthly to any person in Montana upon request mailed to the Secretary of the State Board of Health at Helena.

HEALTH OFFICERS' MEETING.

The meeting of the Montana Health Officers' Association at Lewistown on July 6th and 7th, promises to be a very interesting one. Many of the Health Officers have signified their intention to be present and prepare papers for this meeting.

We expect to have present, Doctor L. D. Fricks of the Public Health Service, Professor W. M. Cobleigh, Professor R. A. Cooley, Dr. Emil Starz, Dr. T. D. Tuttle, and Professor C. W. Tenney.

Governor S. V. Stewart will, if possible, be present and give an address at the Monday evening meeting.

We hope to have a large attendance of Health Officers.

MEASLES.

By John F. Anderson, Public Health Service.

Measles may be said to be practically a world-wide disease, one that is always endemic and often epidemic, especially in our larger cities; but in spite of the toll in deaths that it yearly exacts, the large number of persons that it incapacitates for varying periods by illness, and the serious complications and sequelae, measles is too often regarded by physicians and the laity as a necessary incident of childhood. The disease was the cause of 44,080 deaths in the registration area for deaths of the United States during the period 1900 to 1910. The number of deaths as compared with those of certain other diseases in the registration area for deaths during 1910 is shown in the following table:

Disease	Deaths	Deaths per 100,000 population
Diphtheria and croup	11,512	21.4
Measles	6,598	12.3
Scarlet fever	6,255	11.6
Whooping Cough	6,148	11.4
Cerebrospinal meningitis	2,272	4.2
Infantile paralysis	1,459	2.7

While it has been quite the general belief among clinicians for many years that the infective agent of measles is contained in the blood, in the nasal and buccal secretions, and perhaps in the "scales," the experimental data in support of this belief previous to 1911 were very incomplete.

But the work of Anderson and Goldberger on measles converted what had previously been opinions based on clinical observations into proven facts based on laboratory experiments. These authors showed that the monkey was susceptible to infection with measles by inoculation with blood from human cases of the disease. They showed that the apparent insusceptibility of the monkey to infection with measles was largely due to a limitation of the period of infectivity of the blood to the very early stages of the disease before or shortly after the appearance of the eruption. Thirty-six hours after the first appearance of the eruption the infectivity of the blood for the monkey becomes greatly lessened and rapidly decreases. Studies on the nature of the virus as it exists in the circulating blood showed that the infective agent is capable in a certain proportion of cases of passing through a Berkefeld filter and therefore is included among the filterable viruses.

Experiments made to test the infectivity of the nasal and buccal secretions from human cases of measles showed that such secretions, collected within the first 48 hours after the appearance of the eruption, were infective for monkeys by subcutaneous inoculation; this would correspond to about the fourth and sixth days of the disease.

Experiments made to determine the duration of the infectivity of these secretions strongly suggested a reduction if not a total loss of their infectivity with the approach of convalescence. Attempts were made, without success, to demonstrate the presence of the infective agent of measles in the "scales" collected from human cases of the disease from four to seven days after the appearance of the eruption.

Since the work of Anderson and Goldberger was reported, three papers by different workers have been published corroborating their results as to the presence of the virus in the blood of human cases and the susceptibility of the monkey to measles. Hektoen and Eggers, while chiefly concerned in their work on experimental measles in the monkey with a study of the leucocytes, state that the general results of their experiments agree very well with those reported by Anderson and Goldberger.

Nicolle and Conseil have reported the infection of the bonnet monkey with measles by the inoculation of blood drawn

24 hours before the appearance of the eruption. And more recently Lucas and Prizer have reported the observation of Koplik spots in monkeys experimentally infected with measles.

The results of these studies on measles give us our first definite information, based on carefully controlled laboratory experiments, as to the nature of the virus, its means of exit from the body and the probable avenue of infection. The experimental observations on the duration of infectivity of the secretions are in accord with previous clinical observations, that cases of the disease are as a rule not infective after convalescence is well established. The great importance of having definitely determined this point, and the further one as to the noninfectivity of the "scales," from a public health aspect can readily be appreciated.

IN A RECEPTIVE MOOD.

"So you actually went to church last Sunday?"

"I really did."

"Excuse me if I seem skeptical. What was the text."

"Aha. I have you there! The text was 'He giveth his beloved sleep.'"

"Good work. And who was there?"

"All the beloved, it seemed to me."—Cleveland Plain Dealer.

IN ANSWER TO PRAYER.

The author of "Seventy Years Young," Mrs. Emily P. Bishop, tells of one way, and a very good way indeed, of insuring an answer to our prayers.

A little girl's brother set a trap to catch birds. The little girl knew that it was wrong, cruel, against the laws of kindness, and altogether inexcusable. She wept at first, then became cheerful again, and she was asked the cause.

"I prayed for my brother to be a better boy."

"What else?" inquired her mother.

"I prayed that the trap would not catch any little birds."

"What else?"

"Then I went out and kicked the trap all to pieces."

IN THEIR STEPS.

"Look here, now Harold," said a father to his little son, who

was naughty, "if you don't say your prayers you won't go to heaven."

"I don't want to go to heaven," sobbed the boy; I want to go with you and mother."—New Orleans Times-Democrat.

If you mean to succeed, to make anything go,
It won't do to guess, your need is to know.
There are plenty of people who cumber the ground
Who think they move on when they only move round.
Have a purpose and know that your aim is worth while
Don't chase Jack-o'-lanterns for mile after mile.
Don't try to be "smart," it is boomerang's flight
That back on your head will certainly light.
Know your course, toe the mark and be ready to run;
Be off at the signal; the race once begun
Go ahead, like an arrow that flies from the bow;
Don't weaken, don't waver, don't wabble—just go.

COMMUNICABLE DISEASES REPORTED TO THE STATE BOARD OF HEALTH FOR THE MONTH OF JUNE, 1914.

Smallpox—Blaine, 7; Broadwater, 2; Cascade (Excl. of Great Falls), 15; Great Falls, 6; Carbon, 2; Gallatin (Excl. of Bozeman), 1; Choteau, 8; Fergus, 1; Flathead (Excl. of Kalispell), 3; Hill, 2; Jefferson, 2; Lincoln, 2; Meagher, 3; Missoula City, 7; Park (Excl. of Livingston), 3; Livingston, 8; Rosebud, 1, Sanders, 1; Sheridan, 1; Silver Bow* (Excl. of Butte), 5; Butte, 22; Sweet Grass, 1; Teton, 1; Valley, 10; Billings, 4. Total, 119. Total last month, 141.

Diphtheria—Gallatin (Excl. of Bozeman), 1; Custer, 1; Flathead (Excl. of Kalispell), 1; Madison, 1; Meagher, 3; Missoula County, 3; Butte, 3; Total, 13. Total last month, 15.

Scarlet Fever—Broadwater, 1; Cascade (Excl. of Great Falls), 1; Carbon, 7; Chouteau, 3; Custer, 1; Dawson, 6; Anaconda, 1; Flathead (Excl. of Kalispell), 4; Hill, 3; Jefferson, 2; Missoula County, 10; Missoula City, 5; Musselshell, 5; Powell, 2; Silver Bow (Excl. of Butte) 1; Butte, 4; Teton, 4; Valley, 1; Billings, 5; Total, 66. Total last month, 83.

Typhoid Fever—Blaine, 18; Great Falls, 3; Gallatin (Excl. of Bozeman), 1; Chouteau, 3; Custer, 1; Dawson, 2; Kalispell,

1; Hill, 4; Helena. 5; Meagher, 1: Park, (Excl. of Livingston), 1; Sheridan, 1; Stillwater, 1; Sweet Grass, 1; Butte, 1; Teton, 1; Yellowstone (Excl. of Billings), 1. Total, 46. Total last month, 34.

Measles—Blaine. 37; Broadwater, 1; Cascade (Excl. of Gt. Falls), 2; Gallatin, 39; Bozeman, 191; Dawson, 2; Flathead (Excl. of Kalispell), 17; Kalispell, 2; Madison, 9; Meagher, 1; Missoula (Excl. of Missoula City), 2; Missoula City, 16; Musshell, 9; Park (Excl. of Livingston), 37; Sheridan, 1; Silver Bow (Excl. of Butte), 9; Butte, 9; Sweet Grass, 6. Billings, 3; Total, 393. Total last month, 187.

C. S. Meningitis—Sheridan, 1. Total, 1. Total last month, 1.

Spotted Fever—Missoula City, 1; Ravalli, 1. Total, 2. Total last month, 3.

Tuberculosis—Great Falls, 1; Kalispell, 1; Missoula City, 2; Livingston, 1; Sanders, 1; Sheridan, 1; Butte, 4; Stillwater, 1; Total, 12. Total last month, 22.

Whooping Cough—Sheridan, 1. Total, 1. Total last month, 4.

*Four of the smallpox cases reported from Silver Bow county are city cases quarantined at the pest house.

BIRTHS (EXCL. OF *STILLBIRTHS) REPORTED TO THE STATE BOARD OF HEALTH FOR THE MONTH OF MAY, 1914, AND COMPARATIVE BIRTH AND DEATH RECORD IN THE STATE.

	Males	Females	Totals	Deaths	Excess of Births	Excess of Deaths
Beaverhead	8	4	12	5	7	...
Broadwater	2	3	5	2	3	...
Carbon	22	12	34	5	29	...
Cascade Excl. of	11	11	22	9	13	...
Great Falls	33	34	67	30	37	...
Chouteau	13	9	22	6	16	...
Custer	14	10	24	12	12	...
Lawson	28	24	52	11	41	...
Deer Lodge Excl. of	...	...	...	16	...	16
Anaconda	9	9	18	10	8	...
Fergus	28	10	38	9	29	...
Flathead Excl. of	8	10	18	12	6	...
Kalispell	11	5	16	5	11	...
Gallatin Excl. of	8	9	17	9	8	...
Bozeman	5	4	9	7	2	...
Granite	...	2	2	4	...	2
Jefferson	2	2	4	1	3	...
Lewis and Clark Excl. of	2	2	4	1	3	...
Helena	11	9	20	13	7	...
Lincoln	7	3	10	4	6	...
Madison	11	6	17	10	7	...
Meagher	3	8	11	6	5	...
Missoula, Excl. of	5	1	6	7	...	1
Missoula City	14	16	30	16	14	...
Musselshell	9	10	19	7	12	...
Park Excl. of	2	5	7	...	7	...
Livingston	5	4	9	3	6	...
Powell	6	3	9	5	4	...
Ravalli	15	10	25	11	14	...
Rosebud	3	4	7	1	6	...
Sanders	4	2	6	5	1	...
Silver Bow Excl. of	19	17	36	21	15	...
Butte	45	50	95	55	40	...
Sweet Grass	5	4	9	1	8	...
Teton	9	10	19	6	13	...
Valley	2	2	4	5	...	1
Yellowstone Excl. of	7	10	17	6	11	...
Billings	20	9	29	12	17	...
Blaine	12	7	18	10	9	...
Big Horn	1	...	1	1	...	...
Fallon	12	4	16	...	16	...
Hill	19	20	39	12	27	...
Sheridan	4	3	7	8	...	1
Stillwater	4	7	11	1	10	...
Toole	3	2	5	...	5	...
	461	386	847	380	488	21
*Stillbirths						37

DEATHS (EXCL. OF STILLBIRTHS) REPORTED TO THE STATE BOARD OF HEALTH FOR THE MONTH OF MAY, 1914, ARRANGED ACCORDING TO COUNTIES AND PRINCIPAL CITIES.

	Spotted Fever	Small Pox	Tuberculosis	Diphtheria	Scarlet Fever	Measles	Typhoid Fever	Meningitis	Whooping Cough	Pneumonia	Nephritis	Organic Heart Disease	Malignant Tumors	Acute Intestinal Diseases	Violence	Suicide	Alcholism	All Other Causes	Totals
Beaverhead	..	..	..	..	..	..	..	..	..	3	..	..	..	..	2	..	..	..	5
Broadwater	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	2
Carbon	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	3	5
Cascade Excl. of	..	..	..	..	..	..	..	1	..	2	..	..	2	..	2	..	..	2	9
Great Falls	..	..	1	..	..	..	..	..	..	6	3	2	1	..	2	..	..	15	30
Chouteau	..	..	..	..	..	..	..	..	..	1	..	1	..	..	4	..	..	..	6
Custer	..	..	2	..	..	..	..	..	..	2	1	2	..	..	1	..	..	4	12
Dawson	..	..	..	..	..	..	..	..	..	1	1	3	..	..	2	..	..	4	11
Deer Lodge Excl. of	..	..	5	..	..	..	..	..	..	1	..	..	..	..	..	..	..	10	16
Anaconda	..	..	..	..	..	..	..	..	..	1	1	2	..	..	1	..	1	4	10
Fergus	..	..	..	..	..	..	..	..	..	2	1	2	..	..	1	..	1	2	9
Flathead Excl. of	..	..	2	..	..	..	..	..	..	..	2	2	..	..	1	..	..	5	12
Kalispell	..	..	1	..	..	..	1	..	..	..	1	..	..	..	..	1	..	1	5
Gallatin Excl. of	..	..	..	1	..	..	..	..	..	1	..	1	..	..	..	1	..	[illegible]	9
Bozeman	..	..	2	..	1	..	..	..	..	..	1	..	..	..	1	..	..	2	7
Granite	..	..	..	..	..	..	..	..	..	1	..	1	1	..	..	..	..	1	4
Jefferson	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1
Lewis and Clark Excl. of	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1
Helena	..	..	1	..	..	..	2	1	..	1	1	4	..	..	1	..	..	2	13
Lincoln	..	..	..	..	..	..	..	..	..	1	..	..	..	..	2	1	..	..	4
Madison	..	..	1	..	..	..	..	..	..	1	1	2	..	..	..	2	..	3	10
Meagher	..	..	..	2	..	..	..	..	..	1	1	..	..	..	..	..	1	1	6
Missoula Excl. of	..	..	2	..	..	..	..	..	..	..	..	2	1	..	1	..	..	1	7
Missoula City	2	..	1	..	1	..	1	..	..	1	..	2	..	..	3	..	1	4	16
Musselshell	..	..	1	..	..	..	..	..	..	1	..	..	..	1	1	1	..	2	7
Park Excl. of	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Livingston	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	2	3
Powell	..	..	..	..	..	..	..	..	..	..	..	1	..	..	2	..	..	2	5
Ravalli	1	..	..	..	..	..	..	..	..	1	..	1	..	..	2	1	..	5	11
Rosebud	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1
Sanders	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	3	5
Silver Bow Excl. of	..	..	7	..	..	..	1	..	..	3	1	3	..	1	2	..	1	2	21
Butte	..	..	6	..	..	..	..	2	..	8	4	5	1	1	6	3	2	17	55
Sweet Grass	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1
Teton	..	..	..	..	..	..	..	..	..	1	..	3	1	..	..	..	..	1	6
Valley	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	5
Yellowstone Excl. of	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	2	..	2	6
Billings	..	..	..	..	..	..	1	..	..	1	1	3	1	1	..	..	..	4	12
Blaine	..	..	..	..	..	..	1	..	1	2	..	1	..	1	1	1	..	2	10
Big Horn	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1
Fallon	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hill	..	..	..	..	1	1	..	..	..	2	..	1	1	..	..	..	..	6	12
Sheridan	..	..	3	..	..	..	..	..	..	1	..	1	..	..	..	..	..	3	8
Stillwater	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1
Totals	3	..	38	3	1	2	8	4	1	46	22	48	11	5	43	13	7	125	380

Estimated population	420,000
Monthly death rate per 1,000 population	.904
Annual death rate per 1,000 population	10.84

DIVISION OF FOODS AND DRUGS.

Dr. W. F. Cogswell, Secretary State Board of Health, Food and Drug Commissioner.

F. J. O'Donnell, Inspector.

LABORATORY STAFF.

W. M. Cobleigh, Chemist.
D. L. Weatherhead, Analyst.
D. B. Swingle, Bacteriologist.
Carl Gottschalck, Assistant Analyst.
Nina Armstrong, Clerk and Stenographer.

Samples reported during the month of May.

Classification	Legal	Illegal	Unofficial	Total
Butter (Dairy Commissioner)	..	4	..	4
Butter (Board of Health)	1	..	..	1
Cream (Board of Health)	1	..	2	3
Coffee Compound	..	1	..	1
Flavoring extracts	3	..	..	3
Ice Cream (Dairy Commissioner)	4	1	..	5
Milk (Board of Health)	1	..	..	1
Miscellaneous Canned Goods	4	1	..	5
Water	..	..	..	52
Total	14	7	2	75

Sixty-six samples were reported to the Secretary of the State Board of Health during the month of May. Of this number fifty-two were samples of water. The fourteen samples of food were of a miscellaneous nature; one sample of milk, three of cream, one of butter, one coffee compound, three vanilla extracts and five samples of canned sea food.

The coffee compound was somewhat deficient in chicory but was otherwise in good condition. One can of oysters was a little short in weight. The other samples complied with the standard.

The fifty-two samples of water were collected as follows:

Big Timber	1
Billings	4
Chinook	5
Glasgow	4
Great Falls	1
Greenspring	1

Hardin	1
Havre	1
Helena	1
Hinsdale	3
Lewistown	1
Livingston	22
Malta	1
Trident	5
Twin Bridges	1
Total	52

A more detailed report of the samples of food follows:

Lab. No.	Date	Description	Remarks
1998	5-29-14	Vanilla Extract. Dealer, Reinig Co., Helena. On label: 4ozs., full measure, warranted Pure, Sherer-Gillett Co., Chicago.	Complies with the standard.
2001	5-29-14	Vanilla Extract. Dealer, Reinig Co., Helena. On label: Colburne's Extract of Vanilla for flavoring ice cream, etc., 2 ozs. full measure. The A. Colburn Co., Philadelphia, Pa.	Complies with the standard.
2015	5-29-14	Vanilla Extract. Dealer, Reinig Co., Helena. On label: Standard Flavoring Extracts, Vanilla Standard pure, Sherer-Gilette Company, Chicago	Complies with the standard.
2907	5-29-14	Clam Bouillion. Dealer, Thos. B. Quaw, Bozeman. On label: Burnham's Clam Bouillion, E. S. Burnham Co., N. Y., U. S. A.	Sample short in volume.
2917	5-29-14	Canned Oysters. Dealer, Forristell & Heilman, Bozeman On label: Blue Jay Oysters, packed by Dunbar Lopez & Dukate Co., New Orleans, Biloxi, net contents 8 ozs., oyster meat	Misbranded.
2918	5-29-14	Otter Brand Clams. Dealer, Forristell and Heilman, Bozeman, Mont. On label: Otter Brand Clams, Quinault Canning Co., Copalis, Wn.	Complies with the standard.
2922	5-29-14	Clam Juice. Dealer, Forristell & Heilman, Bozeman. On label: Eagle Brand Clam Juice, A. & R. Loggie, Loggerville, N. B. Canada	Complies with the standard.
2924	5-29-14	Boiled Shrimp. Dealer, Forristell & Heilman, Bozeman. On label: Boiled Shrimp packed by Kikuya, Tokio, Japan	Complies with the standard.
2979	5-29-14	Coffee Compound. Dealer, J. A. Roades, Square Deal Store, Bozeman. On label: One pound Sherman's Perfecto Coffee Compound, composed of coffee, chicory and cereal. Sherman Bros. & Co., Chicago	Misbranded.
3061	5-18-14	Butter. Dealer, Forsggren & Dillon. On label: Weiser Creamery Co., Weiser, Idaho. This package contains 16 ozs. when made	Complies with the standard.
3144	5-29-14	Cream. Dealer, N. P. Ry. Lunch Room, Billings, Mont. On label: 7X	Complies with the standard.
3145	5-29-14	Milk. Dealer, N. P. Lunch Room, Billings. On label: 7X	Complies with the standard.

Lab No.	Date	Description	Remarks
[illegible] off 34.	5-4-14	Cream. Sent in by Jesse McCarty, Cascade Creamery Co., Cascade, Mont. On label: No. 1 suspected of being preserved	No preservatives detected.
[illegible] off 35	5-4-14	Cream. Sent in by Jesse McCarty, Cascade Creamery Co., Cascade, Mont. On label: No. 2, suspected of being preserved	No preservatives detected.

WATER LABORATORY.

Regulations Governing the Examination of Private and Public Water Supplies.

Experience has shown that more definite regulations governing the analysis of water will increase the efficiency of the laboratory work and make it possible to prepare more complete reports on the sanitary conditions of the water supplies of the state.

In the future health officers and others desiring to have a report on the sanitary qualities of a water supply will be expected to fill out an application blank. On this blank will be stated a complete description of the source of the water to be tested, the reasons for requesting the analysis, and any other facts that may be of value concerning the supply. With this information at hand the water analyst can decide how many containers to ship to insure complete sampling. He can also give more definite directions how and where to take the samples. The analytical processes used can also be varied in a way to give the most complete information.

The regulations are given below:

I. A person wishing the analysis of a public or private water supply must fill out an application blank stating all the reasons for such a request and send the same to the Secretary of the State Board of Health, Helena. Blank forms for such requests are in the possession of all local and county health officers and can be secured from them or from the Board of Health at Helena.

II. Satisfactory reasons for requesting an analysis must be given in each case.

III. Water examinations will be made:

(a) If there is any reason to suspect that a water is the cause of sickness or ill health.

(b) If from an inspection of the source of a water supply there is reason to believe that it is contaminated.

(c) If a water has unusual or abnormal properties with regard to odor, taste, or color.

(d) If a city or town is seeking to improve its water supply by selecting a new source.

(e) If city or town authorities desire information on the necessity of installing water purification works.

(f) If the State Board of Health thinks the conditions warrant an analysis in any given case.

IV. Containers for water samples will in all cases be furnished by the laboratory. As a rule, samples for bacteriological examination must be packed in ice. Samples must be taken in accordance with directions sent with the containers. No charge will be made for the examination, but the parties requesting the analysis will be expected to pay all express charges.

DEER LODGE WATER SUPPLY.

Water samples taken from taps supplying city water in Deer Lodge have been analyzed from time to time. The results of these analyses and the data concerning the sanitary conditions on the watershed collected by Dr. G. J. Marquette, the local Health Officer, made it desirable for the State Board of Health representatives to inspect the source of the Deer Lodge water supply.

This inspection was made May 30th, 1914. The water supply is taken from Cottonwood Creek. The intake is three or miles above the city. At present the water from the creek is taken directly into a pipe line which leads to two reservoirs lined with concrete. It is reported that these reservoirs are cleaned at proper intervals. In the near future it is planned to admit water to the system from a filtration well which has been constructed near the banks of the creek. This will have the effect of delivering a clearer water when the creek is turbid than can be obtained by the present method with a direct intake supplied with metal screens. The water from the reservoir is delivered to the city mains by gravity.

From the sanitary aspect the ideal water-shed which supplies water for domestic use is one on which there are no public highways, no human habitations and no pasturing of farm animals. The water borne diseases are caused by germs which have their origin in the intestinal tract of human beings and animals. The fewer the chances are of admitting animal excreta to a city water supply the safer the water.

There are at least six farm habitations on the watershed of Cottonwood Creek above the Deer Lodge intake. A public road on the watershed from Deer Lodge to Emery, a distance of nine miles, is used by the farmers along the creek and by a few miners at Emery and vicinity.

As a rule the farm houses are near Cottonwood Creek or some of its branches. The miners at Emery live near a branch of the creek. Therefore, conditions of the Deer Lodge watershed are such as to require careful sanitary inspection and supervision. It was found that due attention had been given to sanitary conditions above the intake by Dr. G. J. Marquette. the local Health Officer. Under his orders, all privies near the creek and particularly those placed over branches of the creek have been moved to safe distances. The few miners at Emery have been cautioned not to contaminate the branch of Cottonwood Creek running through the camp. The privies at Emery are located at a safe distance from the creek.

From the laboratory data and from the fact the watershed has had the attention of the local health officer, the opinion is held that Deer Lodge city water was reasonably safe at the time this investigation was conducted. However, sanitary inspections should be made in the future to note any change in conditions and to keep the people living on the watershed in full sympathy with the efforts of the health authorities to protect the water supply from contamination. It would be desirable to post notices to picnic parties and other visitors warning them of the dangers of contaminating a watershed supplying water for domestic use.

DEER LODGE CITY WATER AND COTTONWOOD CREEK.
PARTS PER MILLION.

Laboratory Number.	Description.	Date.	Solids	Nitrogen As		Nitrogen As		Oxygen Consumed.	Chlorine.	Bacteriological Examination.	
				Free Ammonia.	Albuminoid Ammonia	Nitrites.	Nitrates.			Gas in lactose bile	B. Coli
278	City tap	7- 5-10	...	.080	.100	.0030	.20	**4.1**	**7.5**		
2533	City tap	9-26-13	210	.092	.180	.0000	.02	1.90	18.3		Negative
2771	City tap	1-28-14	230	.020	.100	.0000	.08	0.75	13.7	Negative	
3152	Cottonwood Creek just above Bagg's Creek....	6- 2-14	88	.032	.048	.0000	.04	2.90	3.96		
3153	Cottonwood Creek, intake City Water Works	6- 2-14	74	.033	.120	.0000	.02	2.85	2.48	Negative	Negative
3154	Small creek just below Emery	6- 2-14	...	...	...	....				Negative	Negative
3155	Small branch just below ranch on Bagg's Creek	6- 2-14	...	...	....	.....				Negative	Negative

PIPESTONE CREEK AND THE NORTHERN PACIFIC RAILROAD WATER SUPPLY AT WHITEHALL.

A laboratory examination of the Northern Pacific Railroad water supply at Whitehall, was made on March 26th, 1914, and direct evidences that the water was contaminated were found. A field survey of the source of this water supply was made by Dr. L. R. Packard, the local Health Officer, and conditions were found which were unsatisfactory from the sanitary aspect. It was therefore decided that the water could not be recommended for public consumption. On receiving this information the railroad company discontinued the use of the Whitehall water for drinking on passenger trains on the Ruby Valley branch.

On May 31st, 1914, Dr. Cogswell, Secretary of the State Board of Health, Dr. L. R. Packard, local Health Officer, and the writer, made a field survey of Pipestone Creek, the results of which are given below. The survey did not extend above Pipestone Springs.

Water sample No. 3156, taken from Pipestone Creek above the springs shows very direct evidences of contamination. The source of this contamination will be located on some future survey.

At Pipestone Springs several sources of contamination were found. A few water closets are in use which empty into branches of the main creek. One privy was located directly over the creek. A hog pen and a chicken yard, both on branches of the creek add considerable contamination. The overflow from the plunge bath goes to the creek. This is not a serious factor at this time because of the burning some months ago of both the hotel and plunge bath house. In case the hotel is rebuilt, the State Board of Health should outline the plans for a sewage disposal system and a method for taking care of the overflow from the plunge baths.

There are several farm habitations on the main creek and also on Little Pipestone Creek, which is above the Northern Pacific Railroad intake. For some distance above the intake the railroad track runs parallel with the creek and only a few feet away from it. Human excreta dropped from passenger trains is therefore, another source of contamination that cannot be overlooked in this survey.

The Northern Pacific intake is about three to four miles above Whitehall. An infiltration well on the banks of the creek is used but some water flows direct from the creek to the well, consequently there is little purification by filtration. Water sample No. 3158, secured at the intake shows evidences of contamination according to the laboratory examination.

The water in the intake well flows by gravity to a water tank in the Whitehall yards. Some purification takes place in the the tank due to sedimenta tion. However, this purification should not be relied on to make the water perfectly safe, as shown by laboratory reports No. 2891 and No. 3159, which indicate that the water is still contaminated.

It is therefore concluded that the field survey of the source of the water in the Northern Pacific Railroad plant at Whitehall shows conditions which are not satisfactory from the sanitary aspect. In the laboratory examination of samples of water from Pipestone Creek and from taps in the roundhouse direct evidences of the presence of contamination were found. This water, therefore, cannot be recommended for public consumption without purification.

It would be difficult o disinfect the water with hypochlorite in a gravity system of that kind. The water could be purified by distillation in sufficient quantities for the use of railway employees in the roundhouse and yards. It would also be possible to install a small mechanical filter for this purpose.

PIPESTONE CREEK AND N. P. RY. WATER SUPPLY, WHITEHALL.

Laboratory Number.	Description.	Date.	Solids	Nitrogen As		Nitrogen As		Oxygen Consumed.	Chlorine.	Bacteriological Examination.	
				Free Ammonia	Albuminoid Ammonia	Nitrites	Nitrates			B. coli	Gas in lactose bile
2891	Tap in Roundhouse	3-26-14	231	Trace	.128	.0000	.02	4.10	8.40	Positive	Positive
3156	Pipestone Creek just above Pipestone Springs	6- 2-14	137	.042	.209	.0000	.02	3.95	3.96	Positive	Positive
3157	Pipestone Creek one mile below Pipestone Springs	6- 2-14	..	.. .	....	.....	...	....	.....	Positive	Positive
3158	Pipestone Creek intake N. P. Ry. water system	6- 2-14	200	.064	.195	.0000	.02	4.40	14.35	Positive	Positive
3159	Tap in Roundhouse	6- 2-14	240	.034	.106	.0000	.04	3.75	10.90	Positive	Positive

HAVRE CITY WATER.

The water supply for the city of Havre is pumped from a series of driven wells. Ground waters in Northern Montana are very often charged with mineral salts in solution. Popularly these salts are termed alkali. It is important to note that the Havre city water has a low mineral content compared with the general run of ground waters in that region.

Naturally, surface waters in the mountainous portions of the state have comparatively a low mineral content and are therefore, better sources for city use. The analysis of the Havre City water is tabulated below trusting that this information may be of value to other cities and towns in northern Montana where ground water must be the source of supply. An engineer, who has studied the geology of the location of the Havre wells might secure information that would be of service in locating sources of satisfactory ground waters in other towns.

ANALYSIS.

Appearance.

Turbidity	None
..Sediment	None
Color	None
Odor	None

Chemical Examination.

	Parts per million.
Total solids	670.00
Free ammonia	0.05
Albuminoid ammonia	0.103
Nitrogen as nitrites	0.000
Nitrogen as nitrates	0.40
Oxygen consumed	0.75
Chlorine	7.92
Carbonates (Co^3)	228.80
Sulphates (SO^4)	173.50
Calcium (Ca)	56.00
Magnesium (Mg)	29.00

The above radicals are probably combined in the following form:

	Pts. per Million	Grs. per U. S. Gal.
Calcium carbonate	140.00	8.16
Magnesium carbonate	101.50	5.92
Sodium carbonate	127.70	7.45
Sodium chloride	13.00	0.76
Sodium sulphate	256.80	14.97
	639.00	37.26

REPORT OF BACTERIOLOGICAL EXAMINATIONS MADE DURING THE MONTH OF MAY, 1914, BY EMIL STARZ, BACTERIOLOGIST.

May 1, 1914.

Dr. G. M. Crabb, Deer Lodge, Montana. Culture for Diphtheria Bac.: Negative.

Dr. G. Worstell, Big Sandy, Montana. Blood for Widal Reaction: Positive. Blood for Widal Reaction: Negative.

Dr. P. H. O'Malley, Chinook, Montana. Blood for Widal Reaction: Negative. Blood for Widal Reaction: Positive.

May 2, 1914.

Dr. Marshall, Stevensville, Montana. Sputum for Tub. Bac.: Negative.

Dr. Poole, Broadview, Montana. Sputum for Tub. Bac.: Negative.

Dr. Mott Arnold, Billings, Montana. Sputum for Tub. Bac.: Negative.

May 3, 1914.

Dr. H. B. Tice, Two Dot, Montana. Culture for Suspect Diphtheria: Positive.

May 4, 1914.

Dr. W. C. Riddell, Helena, Montana. Blood for Widal Reaction: Positive.

Dr. P. H. O'Malley, Chinook, Montana. Blood for Widal Reaction: Positive.

Dr. P. H. O'Malley, Chinook, Montana. Blood for Widal Reaction: Positive.

May 6, 1914.

Dr. Worstell, Big Sandy, Montana. Blood for Widal Reaction: Positive. Blood for Widal Reaction: Positive.

May 7, 1914.

Dr. E. Johnston, Helena, Montana. Blood for Widal Reaction: Negative.

May 8, 1914.

Dr. P. H. O'Malley, Chinook, Montana. Blood for Widal Reaction: Positive.

Dr. W. C. Riddell, Helena, Montana. Blood for Widal Reaction: Positive.

Dr. Bassow, Havre, Montana. Blood for Widal Reaction: Positive.

May 9, 1914.

Dr. C. Schaefer, Helena, Montana. Sputum for Bac. Tub.: Negative.

Dr. L. Fligman, Helena, Montana. Sputum for Bac. Tub.: Negative.

Dr. A. Movius, Billings, Montana. Culture from suspected Diphtheria: Negative.

May 10, 1914.

Dr. Marquette, Deer Lodge, Montana. Culture from suspected Diphtheria: Staphylococci.

May 11, 1914.

Dr. P. H. O'Malley, Chinook, Montana. Blood for Widal Reaction: Positive. Blood for Widal Reaction: Negative.

Dr. W. C. Riddell, Helena, Montana. Sputum for Tub. Bac.: Negative.

Dr. N. Salvail, Helena, Montana. Sputum for Bac. Tub.: Negative.

Dr. S. G. Reed, Big Timber, Montana. Sputum for Tub. Bac.: Negative.

May 12, 1914.

Dr. Th. D. Tuttle, Warm Springs, Montana. Sputum for Tub. Bac.: Negative.

Dr. Hoon, Chinook, Montana. Blood for Widal: Positive.

Dr. P. H. O'Malley, Chinook, Montana. Blood for Widal: Positive.

May 13, 1914.

Dr. R. A. Morrill, Sidney, Montana. Sputum for Bac. Tub.: Negative.

Dr. A. Hoon, Chinook, Montana. Blood for Widal: Positive.

Dr. Albert A. Pastene, Chester, Montana. Blood for Widal Reaction: Positive.

Dr. F. Ross, Harlowtown, Montana. Sputum for Bac. Tub.: Negative.

May 14, 1914.

Dr. R. Horsky, Helena, Montana. Blood for Widal: Positive.

Dr. Peek, Helena, Montana. Sputum for Tub. Bac.: Negative.

May 15, 1914.

Dr. E. Johnston, Helena, Montana. Blood for Widal. Negative

Dr. McCabe, Helena, Montana. Pus for Tub.: Bac. Negative.

Dr. E. Johnston, Helena, Montana. Blood for Widal: Positive.

Dr. R. Horsky, Helena, Montana. Blood for Widal: Negative.

May 16, 1914.

Dr. Whiting, Alberton, Montana. Culture for suspected Dipth. Bac.: Negative. Culture for suspected Diphth. Bac.: Negative. Culture for suspected Diphth. Bac.: Positive. Culture for suspected Diphth. Bac.: Positive.

Dr. P. H. O'Malley, Chinook, Montana. Blood for Widal: Positive.

Dr. R. Horsky, Helena, Montana. Culture from suspected Diphtheria: Positive.

Dr. A. V. Blackstone, Absarokee, Montana. Blood for Widal: Positive.

Dr. P. H. O'Malley, Chinook, Montana. Blood for Widal: Negative.

Dr. McCabe, Helena, Montana. Sputum for Tuberc. Bac.: Negative.

Dr. J. M. Keats, Antelope, Montana. Sputum and Urine for Tub. Bac.: Negative.

Dr. John Treacy, Helena, Montana. Blood for Widal: Positive.

May 18, 1914.

Dr. H. B. Tice, Two Dot, Montana. Culture from suspected Diphtheria: Stereptococci.

May 19, 1914.

Dr. C. Seerley, Manhattan, Montana. Smear from Throat: Staphylococci.

Dr. E. F. Ross, Harlowtown, Montana. Sputum for Bac. Tuberc.: Negative.

Dr. S. K. Campbell, Harlowtown, Montana. Sputum for Bac. Tuberc.: Negative.

Dr. L. Fligman, Helena, Montana. Sputum for Tub. Bac.: Negative.

Dr. J. Treacy, Helena, Montana. Blood for Widal Reaction: Positive.

Dr. P. H. O'Malley, Chinook, Montana. Blood for Widal: Positive.

May 20, 1914.

Dr. S. D. Whiting, Alberton, Montana. Four cultures for Diphth. Bac. Release case: All Negative.

May 21, 1914.

Mrs. Barry, Hysham, Montana. Sputum for Bac. Tub.: Negative.

Dr. R. H. Beach, Glendive, Montana. Blood for Widal: Positive.

May 22, 1914.

Dr. C. C. Seerley, Manhattan, Montana. Two smears for Bac. Diphtheria: Both Positive.

Dr. S. K. Campbell, Harlowtown, Montana. Sputum for Bac. Tub.: Negative.

Dr. E. Johnston, Helena, Montana. Blood for Widal: Negative.

Dr. C. F. Bassow, Havre, Montana. Sputum for Tub. Bac.: Negative.

Dr. W. A. Hulbush, Cut Bank, Montana. Sputum for Bac. Tub.: Negative.

May 23, 1914.

Dr. Place, Great Falls, Montana. Blood for Widal: Positive.

Dr. McCabe, Helena, Montana. Sputum for Tub. Bac.: Negative.

Dr. P. H. O'Malley, Chinook, Montana. Blood for Widal Reaction: Positive.

May 24, 1914.

Dr. S. D. Whiting, Alberton, Montana. Four cultures for Diphtheria Bac. (Release case): All four negative.

May 25, 1914.

Dr. C. C. Seerley, Manhattan, Montana. Throat smear for Bac. Diphtheria: Negative.

Dr. R. Horsky, Helena, Montana. Blood for Widal Reaction: Negative.

May 26, 1914.

Dr. W. J. Perry, Billings, Montana. Sputum for Bac. Tub.: Negative.

Dr. Brooke, Helena, Montana. Culture for Bac. Diphth: Streptococci.

Dr. C. C. Seerley, Manhattan, Montana. Three smears from throat: 2 Negative; 1 Positive.

Dr. H. H. Parsons, Glendive, Montana. Culture for Bac. Diphtheria: Negative.

Dr. McCabe, Helena, Montana. Sputum for Bac. Tub.: Negative.

May 27, 1914.

Dr. W. G. Dye, Deer Lodge, Montana. Blood for Widal Reaction: Positive.

Dr. A. Hoon, Chinook, Montana. Blood for Widal: Positive.

May 28, 1914.

Dr. Claiborn, Big Timber, Montana. Blood for Widal Reaction: Positive.

Dr. C. C. Seerley, Manhattan, Montana. Smear from throat for Diphtheria Bac.: Negative.

May 29, 1914.

Dr. P. H. O'Malley, Chinook, Montana. Blood for Widal: Positive.

Dr. P. H. O'Malley, Chinook, Montana. Blood for Widal Reaction: Negative.

May 30, 1914.

Dr. J. Werham, Billings, Montana. Culture for Bac. Diph. theria: Only Staphylococci.

Dr. L. Fligman, Helena, Montana. Blood for Widal: Negative.

May 31, 1914.

Dr. C. C. Seerley, Manhattan, Montana. Throat smear for Bac. Diphtheria: Negative.

Respectfully submitted,

EMIL STARZ, Bacteriologist.